

Patent Claims

What is claimed is:

1. A manually operated sprayer for a container of liquid to be sprayed, comprising, variable volume pump means having liquid inlet means for connecting the pump means with liquid in the container, outlet means connecting the pump means with a discharge opening, a manual actuator for activating the pump means for pumping liquid from the container through the outlet means and the discharge opening, the sprayer including a control module having spring biased product and vent valves reciprocally disposed therein, said product and vent valves being simultaneously reciprocable by means of said manual actuator between valve open and valve closed positions, wherein in said valve open position, said product and vent valves respectively preventing flow of product and air respectively into said liquid inlet means and into a vent passage in communication between atmosphere and an interior of the container, and in said valve closed position, said product and vent valves respectively enabling flow of product and air respectively into said liquid inlet means and into said vent passage.
2. The sprayer according to claim 1, wherein said product and vent valves sealingly engaging confronting internal walls in said control module to prevent flow of product and air.
3. The sprayer according to claim 1, said product and vent valves each including a resilient conical section sealingly engaging confronting internal walls in said control module to prevent flow of product and air.
4. The sprayer according to claim 1, wherein said product and vent valves being formed of a single unitary structure.
5. The sprayer according to claim 1, wherein said product and vent valves being formed of a plurality of components fitted together.

6. The sprayer according to claim 1, wherein said product and vent valves include a first elongated section and a second cap section fitted together, said first elongated section including a first conical portion tapered outwardly to engage a confronting internal wall in said control module, a second elongated portion and a third elongated portion, said cap section including a first conical portion tapered outwardly to engage another confronting internal wall in said control module, and a second elongated portion, said conical portions of said first elongated section and said second cap section engaging said confronting internal walls of said control module to prevent flow of product and air.
7. The sprayer according to claim 1, wherein said actuator being depressable to first operate said pump means and thereafter activate said product and vent valves to enable flow of product and air into said liquid inlet means and said vent passage, respectively.
8. The sprayer according to claim 1, wherein the manual actuator comprises first and second protrusions for respectively operating a switch for engaging said motor means and thereafter operating said product and vent valves for enabling flow of product and air into said liquid inlet means and said vent passage, respectively.
9. The sprayer according to claim 1, wherein said manual actuator comprises a trigger lever which is normally returned to a relaxed position by a spring outwardly biasing said product and vent valves upon release of manual pressure applied to the lever.
10. The sprayer according to claim 1, wherein said sprayer includes electric motor means for operating the pump means, battery means for operating the motor means, and manually operable switch means for selectively operating the motor means.
11. The sprayer according to claim 1, wherein the manual actuator comprises a trigger lever.

12. A manually operated sprayer for a container of liquid to be sprayed, comprising, variable volume pump means having liquid inlet means for connecting the pump means with liquid in the container, outlet means connecting the pump means with a discharge opening, a manual actuator for activating the pump means for pumping liquid from the container through the outlet means and the discharge opening, the sprayer including a control module having spring biased product and vent flow control means disposed therein, said product and vent flow control means being operable by means of said manual actuator between valve open and valve closed positions, wherein in said valve open position, said product and vent flow control means respectively preventing flow of product and air respectively into said liquid inlet means and into a vent passage in communication between atmosphere and an interior of the container, and in said valve closed position, said product and vent flow control means respectively enabling flow of product and air respectively into said liquid inlet means and into said vent passage.

13. The sprayer according to claim 12, wherein said product and vent flow control means sealingly engaging confronting internal walls in said control module to prevent flow of product and air.

14. The sprayer according to claim 12, said product and vent flow control means each including a resilient conical section sealingly engaging confronting internal walls in said control module to prevent flow of product and air.

15. The sprayer according to claim 12, wherein said product and vent flow control means include a first elongated section and a second cap section fitted together, said first elongated section including a first conical portion tapered outwardly to engage a confronting internal wall in said control module, a second elongated portion and a third elongated portion, said cap section including a first conical portion tapered outwardly to engage another confronting internal wall in said control module, and a second elongated portion, said conical portions of said first elongated section and said second cap section

engaging said confronting internal walls of said control module to prevent flow of product and air.

16. The sprayer according to claim 12, wherein said actuator being depressable to first operate said pump means and thereafter activate said product and vent flow control means to enable flow of product and air into said liquid inlet means and said vent passage, respectively.

17. The sprayer according to claim 12, wherein the manual actuator comprises first and second protrusions for respectively operating a switch for engaging said motor means and thereafter operating said product and vent flow control means for enabling flow of product and air into said liquid inlet means and said vent passage, respectively.

18. The sprayer according to claim 12, wherein said manual actuator comprises a trigger lever which is normally returned to a relaxed position by a spring outwardly biasing said product and vent flow control means upon release of manual pressure applied to the lever.

19. The sprayer according to claim 12, wherein said sprayer includes electric motor means for operating the pump means, battery means for operating the motor means, and manually operable switch means for selectively operating the motor means.

20. The sprayer according to claim 12, wherein the manual actuator comprises a trigger lever.